REMARKS

Applicant has canceled claims 17-18, without prejudice, and amended various paragraphs throughout the specification. No claims have been amended herein.

Claims 1-6, 8-14 and 16 are pending. Reconsideration of this application, as amended, is requested.

Amendments to the Specification

Presented herein, for the majority, are the amendments to the specification previously made in the paper filed April 18, 2005; the amendment to paragraph [0008] made herein is different than the amendment proposed to the paragraph in the paper filed April 18, 2005. Applicants thank the Examiner for the thorough review of the application and the indication of the page/line locations of the amended paragraphs. To assure no further confusion regarding the pagination of the originally filed application, the amendments to the specification made herein have been made identifying the paragraph number as in the published application, US 2005/0060944 A1.

Applicants note that the amendment to the title is not repeated in this paper, due to Applicants understanding that that amendment was entered.

The amendments made address the various concerns raised in the Office Action.

The patent number for patent application U.S. Ser. No. 08/120,300 filed Sep. 13, 1993, has been provided as U.S. Patent No. 6,129,540.

The drawings were objected to for including reference numbers in the figures that were not described in the specification. Reference numbers "402" and "404" have been added to the specification.

The drawings were also objected to for not including references described in the specification, i.e., 601, 603, 605, etc. The specification has been amended to remove reference to numbers not in the figures.

The specification has been amended so that "abrasive article" is "20" in all occurrences.

12

Section 112 Rejections

Claims 1-6, 8-14 and 16-18 were rejected under 35 U.S.C. 112, first paragraph.

The Office Action contends that the phrase "wherein the offset vectors for the plurality of protruding units do not exhibit a sum of zero" is new matter and that the specification does not provide clear support for exhibiting a sum of zero. The Office Action contends that the specification only defines that the sum "does not approach zero" and variations thereon. Applicant disagrees. The Examiner's attention is directed to paragraph [0104] of the published application. This paragraph includes the sentence "Notably, the sum of the offset vectors v_1, v_2, v_3, and v_4 does not equal zero." This shows that having the vectors not sum to zero was in possession of Applicant at the time of filing.

The Office Action also contends that dependent claims 17-18, having the offset vectors the same (claim 17) and different (claim 18), are not clearly supported by the application and argues that although the figure (e.g., FIG. 5) might show to the unaided eye that the vectors can be the same, examination of the units under a microscope might depict a small discrepancy, thus they would not be the same. Applicant believes the Office Action is going to extremes with this argument. However, to not belabor the issue, claims 17 and 18 have been canceled.

Withdrawal of this rejection is requested.

Section 103 Rejection

Claims 1-6, 8-14 and 16-18 were rejected under 35 U.S.C. 103(a) as obvious over Hoopman (U.S. Patent No. 5,672,097). The Office Action relies on the same reasons as set forth in the previous Office Action (of October 20, 2004). Applicant continues to respectfully disagree with this rejection.

The underlying distinction between the claims of the pending application and Hoopman '097 is that the pending claims recite that the article has a plurality of protruding units, each protruding unit having a distal region that defines an offset vector between the projection of the distal region and a center point of the base, and wherein the offset vectors for the plurality of protruding units do not exhibit a sum of zero.

As Applicant has stated before, Hoopman does not teach that the distal region of each of the protruding units can be offset in a manner so that the sum of the vectors of the offset is not zero. Applicant has previously argued that, for example in FIG. 8 of Hoopman, the offset of the

distal regions is random, and that a random offset provides a sum of offset vectors that is zero. The text at column 17, line 62 to column 18, line 12 of Hoopman describes how the angles, which lead to the peak offsets, are obtained.

The current Office Action, on page 10, states that "applicants argue that since the distal regions *[sic]* is random, one would expect the sum of the offset vectors is *[sic]* zero." Applicant agrees that this statement is correct. The Office Action continues that "the examiner is unclear as to this argument because if it is random, why is the sum expected to be zero?" Applicant contends that this argument, that random offset vectors sum to zero, is a statistical fact.

It is well established that a random number generator, given enough numbers, will provide a set of independent numbers that are evenly and identically distributed throughout the set. See, for example, www.mathworld.wolfram.com, "Probability & Statistics", "Random Numbers", "Random Number". Hoopman acknowledges, at column 18, line 7-9 that a uniform distribution of angles is desired; such would be obtained with random angle generation. With that theory that the numbers (e.g., angles) are evenly and identically distributed, a random generation of, for example, whole numbers between -1 and +1 (which includes 0), would produce an equal amount of -1s, 0s, and +1s. When these are summed, the result is zero. A random distribution does indeed mean that the sum is zero.

The Office Action continues that "if the distal regions were controlled, the sum might be zero." That is correct. If the distal regions are controlled, any desired sum could be designed and manufactured, such as a sum of zero or a sum of non-zero. However, as has been noted both by both the Applicant and the Examiner, Hoopman provides random offsets.

As for the position in the Office Action that the figures and claims of Hoopman (e.g., the angle of intersection of the abrasive composites is different), Applicant agrees that this shows or suggests that the composites all define offset vectors; these offset vectors may be positive in value, negative, or be zero (i.e., no offset from center). As argued above, using statistical facts that random numbers will be evenly distributed throughout the range equally on both sides of zero, the sum of the numbers will be zero.

The logic on page 11 of the Office Action, "if all the composite where *[sic]* the same, the vector sum might be zero, but since they are different, one would not necessarily expect the sum to be zero", is faulty. Indeed, the opposite is true. If all the composites were the same, they would all have the same direction and distance of offset, providing a sum of the offsets that is not

14

zero. If the offsets are all different, they would be in different directions and at different distances, and if random as discussed above, one would expect the sum to be zero.

As detailed above, the teachings of Hoopman, that of random offset peaks and different angles of intersection, provide a sum of offset peak vectors that is zero. Applicant contends that it would not have been obvious to one skilled in the art of structured abrasives to create a structured abrasive having the opposite, offset peaks not summing to zero. Much less, it would not have been obvious to make a structured abrasive having all the offset peaks the same.

Applicant contends that the pending claims are patentable over Hoopman, and request that the rejection be withdrawn.

Double Patenting Rejection

Claims 1-6, 8-14 and 16 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of co-pending application no. 10/668,799.

Although Applicant does not acquiesce to this double patenting rejection, to facilitate issuance of a patent from this application, Applicant will submit a terminal disclaimer to obviate the double patenting rejection, when the claims of this application have been indicated to be otherwise allowable.

Summary

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone Applicant's attorney Dan Biesterveld, Reg. No. 45,898, at 651.737.3193.

Respectfully submitted,

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